

Form PTO-1390
(Rev. 5-93)

US DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NO.

H 3775 PCT/US

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

09/856861

INTERNATIONAL APPLICATION NO.

PCT/EP99/08806

INTERNATIONAL FILING DATE

November 16, 1999

PRIORITY DATE CLAIMED

November 25, 1998

TITLE OF INVENTION

ENCAPSULATED DETERGENT

APPLICANT(S) FOR DO/EO/US

Hermann JONKE, Brigitte GIESEN, Daniela POETHKOW, Alexander DITZE and Dagmar ZAIKA

Applicant herewith submits to the United States Designated/Elected Office (EO/DO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). EXECUTED
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment
 - ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information.:

International Search Report (With Information Disclosure Citation and References)

"Express Mail" mailing label number EL 843287400 US

U.S. Application No. (If known see CFR 1.30) <div style="font-size: 2em; font-weight: bold; margin-left: 100px;">097/856861</div>	INTERNATIONAL APPLICATION NO. PCT/EP99/08806	ATTORNEY'S DOCKET NUMBER H 3775 PCT/US																																																								
17. ■ The following fees are submitted: Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO..... \$860.00 International preliminary examination fee paid to USPTO (37CFR 1.482) \$670.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37CFR 1.445(a)(2))..... \$690.00 Neither international preliminary examination fee (37CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$970.00 International preliminary examination fee paid to USPTO (37CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$96.00 <div style="text-align: right; margin-top: 10px;"> ENTER APPROPRIATE BASIC FEE AMOUNT = </div>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">CALCULATIONS</th> <th style="width: 20%;">PTO USE ONLY</th> <th style="width: 20%;"></th> </tr> <tr> <td></td> <td style="text-align: center;">\$</td> <td style="text-align: center;">860 00</td> </tr> <tr> <td>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date 37 (CFR 1.492(e)).</td> <td style="text-align: center;">\$</td> <td style="text-align: center;">0 00</td> </tr> <tr> <td> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">Claims</th> <th style="width: 20%;">Number filed</th> <th style="width: 20%;">Number Extra</th> <th style="width: 20%;">Rate</th> </tr> <tr> <td>Total Claims</td> <td style="text-align: center;">13 - 20 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 X \$18.00</td> </tr> <tr> <td>Independent Claims</td> <td style="text-align: center;">3 - 3 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 X \$80.00</td> </tr> <tr> <td colspan="2">Multiple dependent claims (s)(if applicable) 0</td> <td colspan="2" style="text-align: center;">+ \$260.00</td> </tr> </table> </td> <td style="text-align: center;">\$</td> <td style="text-align: center;">0 00</td> </tr> <tr> <td>TOTAL OF ABOVE CALCULATIONS</td> <td style="text-align: center;">=</td> <td style="text-align: center;">\$ 860 00</td> </tr> <tr> <td>Reduction by 1/2 for filing by small entity, if applicable. 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a. <input type="checkbox"/> A check in the amount of \$ _____ to cover the above fees is enclosed. b. ■ Please charge my Deposit Account No. <u>01-1250</u> in the amount of <u>\$860.00</u> to cover the above fees. A triplicate copy of this sheet is enclosed. Order No. <u>01-0414</u> . c. ■ The Assistant Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>01-1250</u> . A triplicate copy of this sheet is enclosed. NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status. <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> SEND ALL CORRESPONDENCE TO: Henkel Corporation, Law Dept. 2500 Renaissance Blvd, Suite 200 Gulph Mills, PA 19406 </div> <div style="width: 45%; text-align: center;"> <div style="margin-top: 10px;"> SIGNATURE Glenn E. J. Murphy NAME ATTORNEY FOR APPLICANT 33.539 REGISTRATION NUMBER </div> </div> </div>																																																										

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JC18 Rec'd PCT/TC 25 MAY 2001

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PATENT
Docket H 3775 PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re: PCT/EP99/08806

International Filing Date: November 16, 1999
Priority Date: November 25, 1998
Applicant: JONKE, et al.
Title: ENCAPSULATED DETERGENT

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
Washington, DC 20231

Please enter the amendments below before examining this
case on the merits:

IN THE SPECIFICATION:

On page 1, insert below the title:

--CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a U.S. National Stage application
filed under 35 U.S.C. § 371, claiming priority under 35
U.S.C. §§ 119 and 365 of International Application No.
PCT/EP99/08806, filed November 16, 1999, in the European
Patent Office, and DE 198 54 267.4, filed November 25, 1998,
in the German Patent Office.

FIELD OF THE INVENTION--.

On page 1, after line 4, insert the heading:

--BACKGROUND OF THE INVENTION--.

09856361 "T039999999"

On page 2, after line 27, insert the heading:

--DESCRIPTION OF THE INVENTION--.

IN THE ABSTRACT:

Please add to the application as a separate page following the claims the abstract appended to this paper.

IN THE CLAIMS:

Please cancel claims 1 to 17, and add new claims 18 to 33:

18. A manual cleaning composition for hard surfaces comprising a substantially water-free active substance containing at least one surfactant and at least one liquid polymeric carrier encapsulated in a water-soluble or water-dispersible capsule, wherein the active substance:

(i) contains the liquid polymeric carrier in a quantity of less than 25% by weight;

(ii) contains at least one unbranched or branched, acyclic or cyclic, saturated or unsaturated alcohol containing 1 to 10 carbon atoms and one or two primary, secondary or tertiary hydroxy groups and a carbon chain optionally containing one or more oxygen atoms -O-; or

(iii) is free of glycerol.

19. The manual cleaning composition of claim 18, wherein the active substance contains at least one anionic or

nonionic surfactant.

20. The manual cleaning composition of claim 18, wherein the active substance contains at least one anionic and at least one nonionic surfactant.

21. The manual cleaning composition of claim 18, wherein the active substance contains:

a) at least one anionic surfactant of formula (I):



or

b) at least one anionic surfactant of formula II:



in which R^1 and R^3 independently of one another represent aliphatic, linear and/or branched C_{6-22} alkyl groups and/or aromatic, optionally C_{1-18} -alkyl-substituted hydrocarbon radicals, R^2 stands for hydrogen and/or one or more C_{1-4} alkyl groups, x is a number of 0.1 to 6, and M stands for metal cations or ammonium ions.

22. The manual cleaning composition of claim 18, wherein the active substance contains at least one fatty alcohol polyglycol ether and/or at least one alkyl polyglycoside.

23. The manual cleaning composition of claim 18, wherein the active substance contains at least one alkyl ether sulfate and at least one fatty alcohol polyglycol ether.

24. The manual cleaning composition of claim 18, wherein

the liquid polymeric carrier comprises one or more polyethylene glycols.

25. The manual cleaning composition of claim 18, wherein the active substance contains at least one unbranched, acyclic, saturated primary C₁₋₈ monoalcohol, one unbranched, acyclic saturated C₂₋₆ alkylene glycol and/or one unbranched, acyclic saturated C₂₋₆ alkylene glycol mono-C₁₋₈-alkyl ether.

26. The manual cleaning composition of claim 18, wherein the active substance contains one or more amphoteric surfactants or sequestering agents.

27. The manual cleaning composition of claim 18, wherein the capsule comprises at least one natural or synthetic polymer.

28. The manual cleaning composition of claim 18, wherein the capsule comprises gelatine.

29. The manual cleaning composition of claim 18, wherein the capsule has a volume of 0.1 to 30 ml.

30. A process for the manual cleaning of a hard surface with a water-based cleaning liquor, comprising the steps of forming a cleaning liquor by dissolving or dispersing the composition of claim 18 in an aqueous medium, and applying the cleaning liquor manually to the hard surface to effect cleaning thereof.

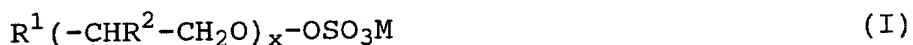
31. A system comprising the composition of claim 18 and at least one other different encapsulated active substance.

32. The system of claim 31, comprising at least one other

encapsulated additive.

33. A manual cleaning composition for hard surfaces comprising an active substance containing 10% to 90% by weight of at least one surfactant, 5% to 35% by weight of at least one liquid polymeric carrier, and less than about 20% by weight of free water, said active substance being encapsulated in a water-soluble or water-dispersible gelatinous capsule, wherein the active substance: (i) contains 5% to 40% by weight of at least one unbranched or branched, acyclic or cyclic, saturated or unsaturated alcohol containing 1 to 10 carbon atoms and one or two primary, secondary or tertiary hydroxy groups and a carbon chain optionally containing one or more oxygen atoms -O-; or (ii) is free of glycerol, and wherein the at least one surfactant comprises:

a) at least one anionic surfactant of formula (I):



or

b) at least one anionic surfactant of formula II:



in which R^1 and R^3 independently of one another represent aliphatic, linear and/or branched C_{6-22} alkyl groups and/or aromatic, optionally C_{1-18} -alkyl-substituted hydrocarbon radicals, R^2 stands for hydrogen and/or one or more C_{1-4} alkyl groups, x is a number of 0.1 to 6, and M stands for metal cations or ammonium ions.

REMARKS

Claims 1 to 17 have been canceled and claims 18 to 33 added. The subject matter of the new claims is described in the specification at page 2, line 28 to page 3, line 15, page 3, lines 20-23, page 4, line 27 to page 5, line 4, page 5, line 17 to page 6, line 15, page 7, lines 10-24, and page 15, lines 18-23, as well as in the claims as originally filed. The specification has been amended to include a cross-reference to related applications and headings appropriate to U.S. practice. No new matter has been added.

The new claims better claim the full literal and equivalent scope and breadth of subject matter disclosed in the application, notwithstanding applicants' belief that the original claims, drafted for examination in the German and European Patent Offices, would have been allowable but for minor matters of form, such as multiple dependency, multiple preferred embodiments in a single claim, and transitional phrases permitted in German practice but objected to in the U.S.P.T.O. The new claims find support in the application independent of the original claims and therefore are not believed to constitute narrowing amendments to the original claims within the holding of Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., No. 95-1066 (Fed. Cir. Nov. 29, 2000).

Applicants respectfully request entry of this Amendment and examination of the application. If any fees are due to enter this paper that have not been accounted for, please charge Deposit Account No. 01-1250.

Respectfully submitted,

Glenn E.J. Murphy
Reg. No. 33,539
Attorney Applicant
(610) 278-4926

Henkel Corporation (61
Patent Department
2500 Renaissance Blvd., Suite 200
Gulph Mills, PA 19406

Encapsulated Detergent

This invention relates to manual cleaning compositions for hard surfaces in the form of a substantially water-free surfactant-containing active substance encapsulated in a water-soluble or water-dispersible material.

5 Conventional detergents/cleaners are generally formulated as thinly liquid to viscous aqueous liquids. On the one hand, a liquid formulation such as this is generally intended to achieve relatively uniform mixing of the active substances in the formulation; on the other hand, the liquid formulations enable the user, when preparing the actual dishwashing or
10 cleaning liquor, to add the detergent/cleaner to the water used for dishwashing or cleaning without coming into hand contact with the product. Hand contact is often undesirable because, in concentrated form, the formulations frequently have an irritating effect on the skin that feels unpleasant to the user. However, the disadvantages of liquid formulations
15 lie, for example, in the fact that a generally large amount of water normally has to be added to the product in order to incorporate solid active ingredients. Unfortunately, this is inappropriate for ecological and economic reasons. The presence of water in the formulations leads to a reduction in the active substance content because, basically, water does
20 not have the requisite cleaning effect. Accordingly, the active substance content per unit weight or volume of the product is reduced by its formulation as a liquid.

Even relatively highly concentrated, commercially available liquid products normally still have a high percentage water content. In addition,
25 the user tends to overdose such concentrates in practice.

However, if products of the type in question are formulated as solids, the user has inconveniently to use dosing aids for measuring the quantity

to be added with the attendant risk of skin contact with the concentrated product which can lead to the consequences mentioned above.

Accordingly, both liquid and solid formulations of manual detergents/cleaners are attended by the disadvantage that exact,
5 ecologically safe and repeatable dosing is difficult for the user to achieve. This is a disadvantage from the perspective of environmentally friendly application.

The problem addressed by the present invention was to provide a storable dosage form for manual detergents/cleaners which would enable
10 highly concentrated, substantially water-free detergents/cleaners to be used simply and safely by the consumer without any of the disadvantages mentioned above.

WO 94/14941 relates to water-based neutral or slightly alkaline machine dishwashing detergents that are free from anionic and cationic
15 surfactants. The machine dishwashing detergents may be accommodated in water-soluble or water-dispersible containers consisting, for example, of gelatine.

EP-A-0 261 754 relates to a foam bath in the form of a mixture of amine salts and long-chain alkyl ether sulfates, 25 to 35% by weight of
20 liquid polyethylene glycols and glycerol encapsulated in an elastic gelatine capsule.

It has now been found that certain active substances containing concentrated mixtures of active ingredients such as occur, for example, in liquid water-based manual detergents/cleaners can be encapsulated in
25 storable form in water-soluble or water-dispersible capsules and that correspondingly encapsulated active substances are eminently suitable for use as a manual detergent/cleaner.

Accordingly, the present invention relates to an encapsulated active substance for a manual cleaning composition for hard surfaces comprising
30 A) a substantially water-free active substance containing

- (i) at least one surfactant and
 - (ii) at least one liquid polymeric carrier
- and
- B) a water-soluble or water-dispersible capsule,
- 5 the active substance
- (ii) containing the liquid polymeric carrier in a quantity, based on the active substance, of less than 25% by weight
- and/or
- (iii) containing at least one unbranched or branched, acyclic or
- 10 cyclic, saturated or unsaturated alcohol containing 1 to 10 carbon atoms and one or two primary, secondary or tertiary hydroxy groups and a carbon chain optionally interrupted by one or more oxygen atoms -O-
- and/or
- (iv) being free from glycerol.
- 15

The present invention also relates to the use of an encapsulated active substance according to the invention as a manual cleaning composition for hard surfaces.

- 20 The present invention also relates to a process for the manual cleaning of a hard surface with a water-based cleaning liquor, the cleaning liquor being prepared by dissolving or dispersing at least one encapsulated active substance according to the invention in water.

- 25 The encapsulated active substances according to the invention are distinguished in particular by their high cleaning performance and their high stability in storage. Compared with encapsulated active substances with no liquid polymeric carrier, they show increased stability in storage. Instead of a high carrier content, they allow a higher content of deterative alcohol component and hence develop greater cleaning power. In addition,
- 30 the encapsulated active substance according to the invention readily

enables the cleaning composition to be provided with a gelatine content as part of the capsule to additionally boost cleaning performance.

In the context of the invention, "active substance" is understood to mean the entire content of the water-soluble or water-dispersible capsule.

5 This can be confined to the components according to the invention as mentioned above or may even be a mixture with other additives as explained hereinafter. Accordingly, the expression "active substance" also encompasses substances which make only an indirect contribution, if any, to the cleaning effect such as, for example, perfume or dyes.

10 A "manual cleaning composition" or "manual hard surface cleaner" in the context of the invention is understood to be a cleaning product which is acquired by the user in concentrated form and which, for use, is dissolved in water with a temperature of up to about 60°C, for example a multipurpose cleaner or a manual dishwashing detergent (MDD). Hard
15 surfaces, such as glass, ceramic, concrete, metal, plastic, and painted or polished surfaces can be subsequently cleaned with the cleaning liquor. The cleaning process is carried out manually by the user. "Manual cleaning" in the context of the invention is understood to be a cleaning process in which the user is in manual contact with the object to be
20 cleaned. By "manual contact" is also meant a contact involving a mechanical aid, for example a cloth, a sponge, a brush or a scrubber.

MDDs are a subgroup of manual cleaning compositions. For use, MDDs are generally dissolved in water with a temperature of up to about 50°C and the dishwashing liquor formed is used for the manual cleaning of
25 dishes and pots and pans. So far as the expression "manual cleaning" is concerned, the foregoing observations apply.

"Substantially water-free" in the context of the present invention means that the active substance contains less than about 20% by weight, preferably less than about 15% by weight, more preferably less than about
30 10% by weight and most preferably less than about 5% by weight of free

water, for example less than 9% by weight.

The expression "free water" stands for water which is not bound as water of crystallization or by adsorption in any of the components present in the active substance.

- 5 The active substance may be present in the capsule as a liquid, as a highly viscous paste or as a solid. It is preferably liquid or flowable.

Capsule

- 10 Basically, the capsule may assume any form although forms which can be efficiently and inexpensively produced are generally preferred. These include, for example, any forms that are symmetrical in rotation relative to at least one axis, for example the spherical form, elliptical forms or cylindrical forms, a capsule in the form of a cylinder closed at either end by hemispherical shells being preferred. The capsule may be in one or
15 more parts, the one-piece or the two-piece, openable and closable form being preferred.

- The capsule has a volume of about 0.1 to about 30 ml. This range includes the normal dosages for manual cleaning compositions in the domestic or industrial sector. The capsule preferably has a volume of
20 about 0.1 to about 10 ml, more preferably in the range from about 0.2 to about 5 ml and most preferably in the range from about 0.2 to about 1 ml, for example 0.5 ml. If large quantities of a cleaning liquor are to be prepared, for example for industrial application, volumes of more than 30 ml may also be appropriate.

- 25 The capsule used in accordance with the invention is soluble in water or at least dispersible in water. In other words, the material of which the capsule consists dissolves at least partly or at least forms a dispersion after introduction into water so that the capsule becomes permeable and allows the exchange of material between the water surrounding the
30 capsule and the ingredients encapsulated by the capsule.

The time required for at least partial dissolution of the capsule in water with a temperature of 35°C is about 10 to 50 seconds and preferably about 20 to 40 seconds. The dissolving process may be assisted by stirring.

- 5 The capsule preferably consists of a material which contains at least one natural or synthetic polymer or a mixture of two or more thereof. The constituent material of the capsule preferably contains gelatine, polyvinyl alcohol, polyethylene glycol, cellulose ether, alginic acid and/or alginates or pectin acid or a mixture of two or more thereof. Gelatine is particularly preferred. In addition, the constituent material of the capsule may contain additives which influence its elasticity and solubility in water. The constituent material of the capsule preferably contains gelatine and a plasticizer, for example glycol, glycerol or sorbitol. The percentage content of plasticizers in the constituent material of the capsule is generally from about 10 to about 40% by weight.
- 10
- 15

Surfactant component (i)

- The active substance may contain one or more surfactants from the group of anionic surfactants, including soaps, nonionic surfactants, amphoteric surfactants or cationic surfactants as the surfactant component (i). The surfactant content of the active substance is in the range from 1 to 99% by weight, preferably in the range from 10 to 90% by weight, more preferably in the range from 20 to 80% by weight, most preferably in the range from 30 to 70% by weight and, in one most particularly preferred embodiment, is in the range from 40 to 60% by weight, for example 45 to 55% by weight.
- 20
- 25

Anionic surfactants.

- Anionic surfactants in the context of the invention are, for example, alkyl benzenesulfonates, alkanesulfonates, olefin sulfonates, alkyl ether
- 30

sulfonates, glycerol ether sulfonates, sulfofatty acids, alkyl or fatty alcohol sulfates, alkyl or fatty alcohol ether sulfates, glycerol ether sulfates, hydroxy mixed ether sulfates, monoglyceride (ether) sulfates, fatty acid amide (ether) sulfates, dialkyl sulfosuccinates, mono- and dialkyl sulfosuccinamates, sulfotriglycerides, amide soaps, ether carboxylic acid and salts thereof, fatty acid isethionates, fatty acid sarcosinates, fatty acid taurides, acyl lactinates, acyl oligoglycoside sulfates, protein fatty acid condensates (more particularly vegetable soya-based products) or alkyl (ether) phosphates or mixtures of two or more thereof.

10 Anionic surfactants from the group of alkyl sulfates and alkyl ether sulfates are particularly preferred for the purposes of the invention. These include, for example, surfactants corresponding to general formula I:



15

and surfactants corresponding to general formula II:



20 in which R^1 and R^3 independently of one another represent aliphatic, linear and/or branched C_{6-22} alkyl groups and/or aromatic, optionally C_{1-18} -alkyl-substituted hydrocarbon radicals, R^2 stands for hydrogen and/or one or more C_{1-4} alkyl groups, x is a number of 0.1 to 6 and M stands for metal cations or ammonium ions.

25 Where R^2 stands for hydrogen and/or one or more C_{1-4} alkyl groups, the compounds corresponding to general formula I are sulfates of mixed ethers obtainable, for example, by alkoxylation of alcohols with ethylene oxide and a C_{1-4} alkylene oxide and/or a mixture of several C_{1-4} alkylene oxides. A mixed alkoxylation reaction such as this may also take place
30 sequentially, in which case block copolyethers ($x = 2$ or more) are formed.

In the interests of clarity, formulae have not been shown for every possible form of the polyethers.

The active substance preferably contains a) at least one anionic surfactant corresponding to general formula I and/or b) at least one anionic surfactant corresponding to general formula II as surfactant.

In one particularly preferred embodiment, R^1 and R^3 independently of one another are aliphatic, linear C_{8-16} hydrocarbon radicals which preferably emanate from oleochemical starting materials. In the latter case, the anionic surfactants are referred to as fatty alcohol ether sulfates.

Fatty alcohol ether sulfates are anionic surfactants which are industrially produced by SO_3 or chlorosulfonic acid (CSA) sulfation of fatty alcohol polyalkylene ethers and subsequent neutralization. Typical examples are the sulfates of addition products of on average 1 to 10 and, more particularly, 2 to 5 moles of ethylene oxide with caproic alcohol, caprylic alcohol, 2-ethylhexyl alcohol, capric alcohol, lauryl alcohol, isotridecyl alcohol, myristyl alcohol, palmitoleyl alcohol, stearyl alcohol, isostearyl alcohol, oleyl alcohol, elaidyl alcohol, petroselinyl alcohol, arachyl alcohol, gadoleyl alcohol, behenyl alcohol, erucyl alcohol and brassidyl alcohol and technical mixtures thereof, the sulfates generally being used in the form of their alkali metal salts, preferably sodium salts, or in the form of their alkaline earth metal salts, preferably magnesium salts, or as mixtures of two or more of the last-mentioned salts. Particularly preferred sulfates are, for example, the commercially available types Texapon N or Texapon K14 (products of Henkel KGaA, Düsseldorf).

In one particular embodiment of the invention, the active substance contains at least one surfactant corresponding to general formula I and at least one surfactant corresponding to general formula II. The ratio between the surfactant or the mixture of surfactants corresponding to general formula I and the surfactant or the mixture of surfactants corresponding to general formula II is preferably about 1:5 to about 5:1, more preferably

about 1:1 to about 4:1 and most preferably about 1.5:1 to about 2.5:1.

For the cleaning performance of a composition for pretreating obstinate soils, a pH in the strongly alkaline range (pH above about 9) is generally appropriate. In this case, surfactants mainly act as wetting
5 agents to improve the wetting of the surfaces to be treated with the cleaning liquor so that any surfactants with a sufficient wetting effect for this purpose may generally be used.

Accordingly, for encapsulated active substances according to the invention for removing obstinate soils, it is sufficient for only one surfactant
10 of general formula II to be present.

The anionic surfactant content of the active substance is in the range from 0.1 to 99% by weight, preferably in the range from 1 to 80% by weight, more preferably in the range from 5 to 60% by weight, most preferably in the range from 10 to 45% by weight and, in one most
15 particularly preferred embodiment, in the range from 13 to 35% by weight, for example 15 to 25% by weight.

Nonionic surfactants

Suitable nonionic surfactants are both high-foaming and low-foaming
20 nonionic surfactants, depending on the particular application.

Typical examples of nonionic surfactants are fatty alcohol polyglycol ethers, alkylphenol polyglycol ethers, fatty acid polyglycol esters, fatty acid amide polyglycol ethers, fatty acid amine polyglycol ethers, alkoxylated triglycerides, alkyl oligoglycosides, fatty acid-N-alkyl glucamides, polyol
25 fatty acid esters, sugar esters, sorbitan esters and polysorbates.

The manual cleaning compositions according to the invention preferably contain products of the addition of alkylene oxides onto linear aliphatic C₈₋₂₂ alcohols as nonionic surfactant or as nonionic surfactants in the active substance. Preferred alkylene oxides are ethylene oxide and
30 propylene oxide. Ethylene oxide is particularly preferred. Typical

examples of fatty alcohols are caproic alcohol, caprylic alcohol, 2-ethylhexyl alcohol, capric alcohol, lauryl alcohol, isotridecyl alcohol, myristyl alcohol, cetyl alcohol, palmitoleyl alcohol, stearyl alcohol, isostearyl alcohol, oleyl alcohol, elaidyl alcohol, petroselinyl alcohol, behenyl alcohol, erucyl alcohol and brassidyl alcohol and the technical mixtures thereof obtained, for example, in the high-pressure hydrogenation of technical methylesters based on fats and oils or aldehydes from Roelen's oxosynthesis and as monomer fraction in the dimerization of unsaturated fatty alcohols. Particular preference is attributed to technical fatty alcohol mixtures in which the fatty alcohols present contain about 12 to about 18 carbon atoms, for example coconut, palm, palm kernel or tallow fatty alcohols.

The ethoxylation product of coconut fatty alcohols (the alcohols containing on average about 4 ethylene oxide units) is particularly preferred.

Other suitable nonionic surfactant(s) are the amides of alkyl carboxylic acids, preferably alkyl carboxylic acids containing about 6 to about 24 carbon atoms, with alkanolamides, preferably monoalkanolamides. The amides obtainable from natural or synthetic fatty acids and fatty acid cuts with aminoethanol are particularly preferred, the monoethanolamides from coconut fatty acid cuts, more particularly C₈₋₁₄ fatty acid cuts, and ethanolamine being most particularly preferred.

Other suitable nonionic surfactants are alkyl polyglycosides and fatty acid glucamides. The nonionic surfactant(s) may serve, for example, as a wetting agent in the manual cleaning composition or may be used to improve the detachment of fat-containing substances. Thus, even the so-called alkyl polyglycosides with the general formula R¹⁰O-(Z)_x, for example, may be used as nonionic surfactant(s).

In these compounds, the alkyl group R¹⁰ contains 6 to 22 carbon atoms and may be both linear and branched. Primary linear or 2-methyl-branched alkyl groups are preferred. Such alkyl groups R¹⁰ are, for

example, 1-octyl, 1-decyl, 1-lauryl, 1-myristyl, 1-cetyl and 1-stearyl groups. 1-Octyl, 1-decyl, 1-lauryl and 1-myristyl groups are particularly preferred. Where so-called "oxo alcohols" are used as starting materials, compounds with an odd number of carbon atoms in the alkyl chain predominate.

5 The alkyl polyglycosides usable in the active substance according to the invention may contain, for example, only one particular alkyl group R^{10} . However, the alkyl polyglycosides are normally produced from natural fats and oils or mineral oils. In this case, mixtures corresponding to the starting compounds or to the particular working up of these compounds are present
10 as the alkyl groups R^{10} .

Particularly preferred alkyl polyglycosides are those in which R^{10} stands

- essentially for C_8 and C_{10} alkyl groups,
- essentially for C_{12} and C_{14} alkyl groups,
- 15 - essentially for C_8 to C_{16} alkyl groups or
- essentially for C_{12} to C_{16} alkyl groups.

Any mono- or oligosaccharides may be used as the sugar unit Z. Sugars containing 5 or 6 carbon atoms and the corresponding oligosaccharides are normally used. Examples of such sugars are glucose,
20 fructose, galactose, arabinose, ribose, xylose, lyxose, allose, altrose, mannose, gulose, idose, talose and sucrose. Preferred sugar units are glucose, fructose, galactose, arabinose and sucrose; glucose is particularly preferred.

The alkyl polyglycosides usable in accordance with the invention
25 contain on average 1.1 to 5 sugar units. Alkyl polyglycosides with values for x of 1.1 to 1.6 are preferred, alkyl polyglycosides in which $x = 1.1$ to 1.4 being most particularly preferred.

The alkoxylated homologs of the alkyl polyglycosides mentioned may also be used in accordance with the invention. These homologs may
30 contain on average up to 10 ethylene oxide and/or propylene oxide units

per alkyl glycoside unit.

Also suitable for use in the manual cleaning compositions according to the invention are surfactants from the family of glucamides, for example alkyl-N-methyl glucamides, the term "alkyl" relating to alkyl groups with a chain length of about 6 to about 14 carbon atoms. It can be of advantage to use the described nonionic surfactants not as sole nonionic surfactant(s), but rather in admixture with at least one other nonionic surfactant, for example in combination with fatty alcohol ethoxylate, alkyl polyglycoside or in combination with fatty alcohol ethoxylate and glucamide or in combination with glucamide and alkyl polyglycoside. Quaternary or even higher combinations of the nonionic surfactants disclosed here are also possible.

In one preferred embodiment of the invention, the active substance contains at least one fatty alcohol polyglycol ether and/or at least one alkyl polyglycoside.

The nonionic surfactant content of the active substance is in the range from 0.1 to 99% by weight, preferably in the range from 1 to 80% by weight, more preferably in the range from 5 to 60% by weight, most preferably in the range from 10 to 45% by weight and, in one most particularly preferred embodiment, in the range from 15 to 35% by weight, for example 20 to 30% by weight.

In another preferred embodiment of the invention, the active substance contains at least one anionic or at least one nonionic surfactant, more particularly at least one anionic and at least one nonionic surfactant, for example at least one alkyl ether sulfate and at least one fatty alcohol polyglycol ether.

In another preferred embodiment of the invention, the ratio by weight of anionic to nonionic surfactants in the active substance is in the range from about 0.1 to about 10:1, preferably in the range from about 0.5 to about 2:1, more preferably in the range from about 0.6 to about 1.5:1 and

most preferably in the range from about 0.7 to about 1.3:1, for example about 0.8:1.

Amphoteric surfactants

- 5 Betaines, for example, may be used as amphoteric surfactant(s). Betaines are mainly obtained by carboxyalkylation, preferably carboxymethylation, of amino compounds. The starting materials are preferably condensed with halocarboxylic acids or salts thereof, especially sodium chloroacetate, 1 mol of salt being formed per mol of betaine.
- 10 Another suitable method is the addition of unsaturated carboxylic acids, for example acrylic acid. Information on the nomenclature and above all on the difference between betaines and "true" amphoteric surfactants can be found in the article by U. Ploog in **Seifen-Öle-Fette-Wachse**, **198**, 373 (1982). Other overviews on this subject have been published, for example,
- 15 by A. O'Lennick et al. in **HAPPI**, Nov. 70 (1986), by S. Holzman et al. in **Tens. Det.** **23**, 309 (1986), by R. Bibo et al. in **Soap Cosm. Chem. Spec.** Apr. 46 (1990) and by P. Ellis et al. in **Euro Cosm.** **1**, 14 (1994).

Examples of suitable betaines are the carboxyalkylation products of secondary and, more particularly, tertiary amines corresponding to general

20 formula (III):



in which R^4 represents alkyl and/or alkenyl groups containing 6 to 22 carbon atoms, R^5 represents hydrogen or alkyl groups containing 1 to 4 carbon atoms, R^6 represents alkyl groups containing 1 to 4 carbon atoms and n is a number of 1 to 6.

25

Typical examples are the carboxymethylation products of hexyl methyl amine, hexyl dimethyl amine, octyl dimethyl amine, decyl dimethyl amine, dodecyl methyl amine, dodecyl dimethyl amine, dodecyl ethyl methyl amine, $C_{12/14}$ cocoalkyl dimethyl amine, myristyl dimethyl amine,

30

cetyl dimethyl amine, stearyl dimethyl amine, stearyl ethyl methyl amine, oleyl dimethyl amine, C_{16/18} tallow alkyl dimethyl amine and technical mixtures thereof.

Also suitable are carboxyalkylation products of amidoamines which
5 correspond to formula (IV):



where R⁷CO is an aliphatic acyl group containing 6 to 22 carbon atoms and
10 0 or 1 to 3 double bonds, m is a number of 1 to 3 and R⁵, R⁶ and n are as defined above.

Typical examples are reaction products of fatty acids containing 6 to 22 carbon atoms, namely caproic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, palmitoleic acid, stearic acid, isostearic
15 acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, linolenic acid, elaeostearic acid, arachic acid, gadoleic acid, behenic acid, erucic acid and technical mixtures thereof, with N,N-dimethylaminoethyl amine, N,N-dimethylaminopropyl amine, N,N-diethylaminoethyl amine and N,N-diethylaminopropyl amine which are condensed with sodium chloroacetate.
20 A condensation product of C_{8/18} cocofatty acid-N,N-dimethylaminopropyl amide with sodium chloroacetate is preferably used.

Other suitable starting materials for the betaines to be used in accordance with the invention are imidazolines corresponding to formula (V):



in which R⁸ is an alkyl group containing 5 to 21 carbon atoms, R⁹ is a

hydroxyl group, an OCOR^8 or NHCOR^8 group and m is 2 or 3. These substances are also known substances which may be obtained, for example, by cyclizing condensation of 1 or 2 moles of fatty acid with polyfunctional amines, for example aminoethyl ethanolamine (AEEA) or diethylenetriamine. The corresponding carboxyalkylation products are mixtures of different open-chain betaines.

Typical examples are condensation products of the above-mentioned fatty acids with AEEA, preferably imidazolines based on lauric acid or $\text{C}_{12/14}$ cocofatty acid, which are subsequently betainized with sodium chloroacetate.

Liquid polymeric carrier component (ii)

Natural or synthetic polymers liquid at room temperature may be used as the liquid polymeric carrier component (ii). Liquid polyethylene glycols such as PEG 600, for example, are particularly suitable. Accordingly, in one preferred embodiment of the invention, the active substance contains one or more polyethylene glycols.

The carrier content of the active substance is in the range from 0.1 to 50% by weight, preferably in the range from 1 to 40% by weight, more preferably in the range from 5 to 35% by weight, most preferably in the range from 10 to 30% by weight and, in one most particularly preferred embodiment, in the range from 15 to less than 25% by weight, for example between 20 and 24% by weight.

The active substance preferably contains as the alcohol component (iii) at least one unbranched, acyclic, saturated primary C_{1-8} monoalcohol, one unbranched, acyclic saturated C_{2-6} alkylene glycol and/or one unbranched, acyclic saturated C_{2-6} alkylene glycol mono- C_{1-8} -alkyl ether.

These are in particular the lower alcohols ethanol, propan-1-ol, propan-2-ol and butan-1-ol, the lower glycols ethylene glycol, 1,3-propylene glycol, 1,2-propylene glycol and 1,2-butyleneglycol and hydroxy ethers,

such as diethylene glycol, dipropylene glycol, ethylene glycol monobutyl ether, propylene glycol monobutyl ether, ethylene glycol monoethyl ether and propylene glycol monoethyl ether or mixtures thereof.

In one preferred embodiment of the invention, the active substance
5 contains at least one unbranched, acyclic, saturated primary C_{1-8}
monoalcohol and one unbranched, acyclic saturated C_{2-6} alkylene glycol
mono- C_{1-8} -alkyl ether, more particularly together with an unbranched,
acyclic, saturated C_{2-6} alkylene glycol, for example ethanol, propylene
glycol monobutyl ether and 1,2-propylene glycol. It can be of advantage to
10 use the monoalcohol and the alkylene glycol monoalkyl ether in
substantially the same quantities of 1 to 20% by weight, preferably 5 to
17% by weight and more preferably 7 to 15% by weight while the glycol is
used in a quantity of preferably 0.1 to 10% by weight, more preferably 0.5
to 6% by weight and most preferably 1 to 3% by weight.

15 The alcohol content of the active substance is in the range from 0.1
to 50% by weight, preferably in the range from 1 to 45% by weight, more
preferably in the range from 5 to 40% by weight, most preferably in the
range from 10 to 35% by weight and, in one most particularly preferred
embodiment, in the range from 15 to 30% by weight, for example between
20 20 and 28% by weight.

In one particular embodiment of the invention, the active substance
contains components (i), (ii) and (iii) in a ratio by weight of about 2:1:1, for
example 1.9:1:1.1. In another particular embodiment where component (i)
is a combination of anionic surfactant (i.1) and a nonionic surfactant (i.2),
25 the ratio by weight of (i.1) to (i.2) to (ii) to (iii) may be about 1:1:1:1, for
example 0.8:1.1:1:1.1.

Sequestering agents

In addition, the active substance may optionally contain
30 sequestering agents. Suitable sequestering agents are, for example, those

from the class of aminopolycarboxylic acids and polyphosphonic acids. The aminopolycarboxylic acids include nitrilotriacetic acid, ethylenediamine tetraacetic acid, diethylenetriamine pentaacetic acid and higher homologs thereof. Suitable polyphosphonic acids are 1-hydroxyethane-1,1-
5 diphosphonic acid, aminotri(methylenephosphonic acid), ethylenediamine tetra(methylenephosphonic acid) and higher homologs thereof, such as diethylenetetraamine tetra(methylenephosphonic acid). The acids mentioned are normally used in the form of their alkali metal salts, more particularly their sodium or potassium salts. Sodium nitrilotriacetate is
10 preferably used and is employed in quantities of up to 10% by weight and preferably in quantities of 2% by weight to 6% by weight, based on the manual cleaning composition.

Other suitable sequestering agents are monomeric polycarboxylic acids or hydroxypolycarboxylic acids, more particularly in the form of their
15 alkali metal salts, for example sodium citrate and/or sodium gluconate.

Preferred sequestering agents include homopolymeric and/or copolymeric carboxylic acids and alkali metal salts thereof, preferably the sodium or potassium salts. Particularly suitable sequestering agents of this type are polymeric carboxylates and polymeric carboxylic acids with a
20 relative molecular weight (M_n) of at least about 350 in the form of their water-soluble salts, more particularly in the form of their sodium and/or potassium salts, for example oxidized polysaccharides according to **WO-A 93/08251**, polyacrylates, polyhydroxyacrylates, polymethacrylates, polymaleates and, more particularly, copolymers of acrylic acid with maleic
25 acid or maleic anhydride, preferably those of 50 to 70% acrylic acid and 50 to 10% maleic acid as characterized, for example, in **EP-A 022 551**. The relative molecular weight of the homopolymers is generally between 1,000 and 100,000 while that of the copolymers is generally between 2,000 and 200,000 and preferably between 50,000 and 120,000, based on free acid.

30 Particularly preferred acrylic acid/maleic acid copolymers have a

relative molecular weight of 50,000 to 100,000.

Suitable but less preferred compounds of this class are copolymers of acrylic acid or methacrylic acid with vinyl ethers, such as vinyl methyl ethers, vinyl esters, ethylene, propylene and styrene in which the percentage content of the acid is at least 50% by weight.

Other suitable polymeric carboxylates or carboxylic acids are terpolymers which contain two carboxylic acids and/or salts thereof as monomers and vinyl alcohol and/or a vinyl alcohol derivative or a carbohydrate as the third monomer. The first acidic monomer or its salt is derived from a monoethylenically unsaturated C₃₋₈ carboxylic acid and preferably from a C₃₋₄ monocarboxylic acid, more particularly from (meth)acrylic acid. The second acidic monomer or its salt may be a derivative of a C₄₋₈ dicarboxylic acid, preferably a C₄₋₈ dicarboxylic acid, maleic acid being preferred. In this case, the third monomeric unit is formed by vinyl alcohol and/or preferably an esterified vinyl alcohol. Vinyl alcohol derivatives which represent an ester of short-chain carboxylic acids, for example C₁₋₄ carboxylic acids, with vinyl alcohol are particularly preferred. Preferred terpolymers contain 60 to 95% by weight and more particularly 70 to 90% by weight of (meth)acrylic acid or (meth)acrylate, preferably acrylic acid or acrylate, and maleic acid or maleate and 5 to 40% by weight and preferably 10 to 30% by weight of vinyl alcohol and/or vinyl acetate. Terpolymers in which the ratio by weight of (meth)acrylic acid or (meth)acrylate to maleic acid or maleate is between 1:1 and 4:1, preferably between 2:1 and 3:1 and more particularly between 2:1 and 2.5:1 are most particularly preferred. Both the quantities and the ratios by weight are based on the acids. The second acidic monomer or its salt may also be a derivative of an allylsulfonic acid substituted in the 2-position by an alkyl group, preferably a C₁₋₄ alkyl group, or an aromatic radical preferably derived from benzene or benzene derivatives.

Preferred terpolymers contain 40 to 60% by weight and more

particularly 45 to 55% by weight of (meth)acrylic acid or (meth)acrylate, preferably acrylic acid or acrylate, 10 to 30% by weight and preferably 15 to 25% by weight of methallyl sulfonic acid or methallyl sulfonate and, as the third monomer, 15 to 40% by weight and preferably 20 to 40% by weight of a carbohydrate. This carbohydrate may be, for example, a mono-, di-, oligo- or polysaccharide. Mono-, di- or oligosaccharides are preferred, sucrose being particularly preferred. The use of the third monomer introduces predetermined weak spots into the polymer which are responsible for its degradability. The terpolymers used can be produced by known, standard methods. Terpolymers either completely or at least partly neutralized, more particularly more than 50% neutralized, based on the carboxyl groups present, are also preferably used.

Polyacetal carboxylic acids obtained, for example, by polymerization of esters of glycolic acid, introduction of stable terminal groups and saponification to the sodium or potassium salts may also be used. Also suitable are polymeric acids obtained by polymerization of acrolein and Canizzaro disproportionation of the polymer with strong alkalis. They are essentially made up of acrylic acid units and vinyl alcohol units or acrolein units.

The percentage content of organic carboxyl-containing builders in the active substance according to the invention may be up to 10% by weight and is preferably in the range from 1% by weight to 7.5% by weight and more preferably in the range from 2% by weight to 5% by weight while the content of polyphosphonic acids is up to 3% by weight, preferably in the range from 0.05% by weight to 1.5% by weight and more preferably in the range from 0.1% by weight to 1% by weight. These substances are also used in water-free form.

According to the invention, other suitable sequestering agents are crystalline alkali metal silicates, for example soda waterglass (modulus 2), and fine-particle alkali metal aluminosilicates, more particularly zeolites of the

NaA type. Suitable zeolites have a calcium binding capacity of 100 to 200 mg CaO/g (according to **DE-C 24 12 837**). Their particle size is normally in the range from 1 μm to 10 μm . They are used in dry form. In the present case, the water present in combined form in the zeolites is not

5 problematical. Preferred crystalline silicates, which may be present either on their own or together with the aluminosilicates mentioned, are crystalline layer silicates with the formula $\text{NaMSi}_x\text{O}_{2+x} \cdot y\text{H}_2\text{O}$, where M is sodium, x is a number of 1.9 to 4 and y is a number of 0 to 20. Preferred values for x are 2, 3 or 4. Crystalline layer silicates such as these are described, for

10 example, in European patent application **EP-A 164 514**. Both β - and δ -sodium disilicates $\text{Na}_2\text{Si}_2\text{O}_5 \cdot y\text{H}_2\text{O}$ are particularly preferred, β -sodium disilicate being obtainable, for example, by the process described in **WO-A 91/08171**. Suitable crystalline silicates are commercially available under the names of SKS-6 (manufacturer: Hoechst) and Nabion®

15 (manufacturer: Rhône-Poulenc). The content of inorganic builders in the manual cleaning composition may be up to about 80% by weight or lower, preferably up to about 25% by weight and, more particularly, about 10% by weight to about 25% by weight.

The manual cleaning compositions according to the invention are

20 preferably phosphate-free. If the presence of phosphate is ecologically acceptable (for example where phosphate-eliminating wastewater treatment is available), polymeric alkali metal phosphates, such as sodium tripolyphosphate, may also be present. Their percentage content may be up to about 50% by weight and is preferably up to about 45% by weight,

25 based on the composition as a whole, the percentage content of the other solids, for example the alkali metal silicate and/or aluminosilicate, being reduced accordingly.

In addition, small quantities of dyes, perfume oils, enzymes, bleaching agents, activators, complexing agents and similar substances

30 typically encountered in dishwashing detergents and/or cleaners may also

be present as additives in the active substance.

Alternatively, these additives - either individually or in admixture and optionally in dissolved or dispersed form - may be completely or partly coated with a water-soluble or water-dispersible material separately from the encapsulated active substance according to the invention and, together with one or more different encapsulated active substances according to the invention, may form a building block system with two or more different encapsulated active substances with which the consumer is able to prepare a water-based cleaning liquor individually adapted to the particular application by appropriate qualitative and quantitative selection of the encapsulated active substances to be combined with one another. Equally, a combination of encapsulated active substances put together for a particular application may be presented to the consumer in a form packaged in an optionally water-soluble wrapping, for example in the form of a water-soluble and/or tearable film of a standard material, such as polyvinyl alcohol, plastic or metal or combinations thereof.

Accordingly, the present invention also relates to a system containing two or more different encapsulated active substances of which at least one is an encapsulated active substance according to the invention.

Besides one or more different encapsulated active substances according to the invention differing, for example, in their surfactant component, a system such as this contains one or more encapsulated active substances each containing one or more additives, more particularly from the group of surfactants, sequestering agents, acids (for example citric acid, acetic acid, formic acid, amidosulfuric acid, hydrochloric acid, sulfuric acid; for example for descaling or cleaning sanitary ware, such as baths or lavatories), bases (for example alkali metal and alkaline earth metal hydroxides and carbonates, such as sodium hydroxide or carbonate, and ammonia and amines; for example for cleaning in the kitchen), bleaching

agents (for example oxygen bleaching agents, such as peroxides, for example hydrogen peroxide, or chlorine bleaching agents, such as alkali metal hypochlorites; for example for the special cleaning of bleachable soils), antimicrobial agents (for example for hygienic cleaning), care components (for example liposomes for skin care), perfumes (for example for individual fragrances and aesthetics) and dyes (for example for individual visual effects and aesthetics).

In order to distinguish between the various encapsulated active substances of the building block system, the capsules and/or - particularly in the case of transparent or translucent capsules - the active substances preferably have different colors, transparent and translucent and white, gray tones and black also being regarded as colors, and/or the capsules have different sizes or volumes and/or different shapes.

In one preferred embodiment of the process according to the invention for the manual cleaning of a hard surface with a water-based cleaning liquor, the cleaning liquor is prepared by dissolving or dispersing one to five encapsulated active substances according to the invention in 0.1 to 10 liters of water.

Instead of one to five encapsulated active substances according to the invention, the process according to the invention may equally well be carried out with one to five encapsulated active substances of the system according to the invention.

The pH value of the water-based cleaning liquor obtained is generally between about pH 5 and about pH 14.

Thus, as manual dishwashing detergents (MDDs), encapsulated active substances are preferably formulated in such a way that the water-based cleaning liquor obtained has a pH in the neutral to slightly acidic range, for example a pH of up to about 8 and more particularly in the range from about 5.5 to about 7.5.

As multipurpose cleaners and the like, the encapsulated active

substances according to the invention are preferably formulated in such a way that the water-based cleaning liquor has a pH in the range from about 6 to about 11 and more particularly in the range from about 6.5 to about 10.5, for example about 7 or even about 9 or about 10.

- 5 For removing obstinate soils, the encapsulated active substances may also be formulated in the more highly alkaline range so that the water-based cleaning liquor has a pH value of about 9 to about 14 and preferably in the range from about 10 to about 13.5.

10

Examples

Example 1: multipurpose cleaner/manual dishwashing detergent

A cleaning composition containing the ingredients listed below was encapsulated in 0.5 ml spherical, elastic gelatine capsules:

- | | |
|-----------------|---|
| 19% by weight | sodium lauryl ether sulfate containing on average 2 |
| 15 | ethylene oxide units (EO) |
| 25.2% by weight | C ₁₂₋₁₄ fatty alcohol containing on average 4 EO |
| 9.5% by weight | ethanol |
| 12.6% by weight | propylene glycol monobutyl ether |
| 23.0% by weight | polyethylene glycol PEG 600 |
| 20 | 1.9% by weight propylene glycol |
| | 0.6% by weight perfume |
| | 8.2% by weight water |

The composition had a pH of 8.5. The capsules were stable in storage for 4 weeks both at room temperature and at 40°C.

25

Example 2: cleaning performance

- Cleaning liquors **E1** to **E6** differing in concentration (conc.) were prepared by dissolving 1 or 5 capsules (C.) of Example 1 in 0.1, 1 or 10 liters of water and were tested for cleaning performance by the *Gardner*
- 30 test. The cleaning performance of the cleaning liquor **V1** of a commercially

available multipurpose cleaner, which contained 6 ml of the cleaner in 1 liter of water (recommended dosage), was tested for comparison. **E5** had a pH value of 7.

Cleaning performance was determined - unless otherwise indicated - to the *Qualitätsnormen für Fußbodenpflege- und reinigungsmittel* (Quality Standards for Floor Care and Cleaning Products) of the *Industrieverband Putz- und Pflegemittel e.V. (IPP)*, Frankfurt/M. (*Seifen - Öle - Fette - Wachse*) 1986, 112, 371-372) for dilute products. In this test, a white dirt/soil carrier treated with test soil is wiped under defined conditions with a sponge soaked with the test liquid and the cleaning effect is photoelectrically measured against the untreated white soil carrier.

The wiper used similar to the *Waschbarkeits- und Scheuerprüfgerät 494* (Washability and Scouring Tester 494) of *Erichsen GmbH, D-58675 Hemer-Sundwig* with a brass guide rail and an 820 g attached weight. Whiteness was measured with a *Dr. Lange Micro-Color* (an instrument for measuring color difference, manufacturer: *Dr. Lange*, D-40549 Düsseldorf), the result being expressed as the average of 21 measurements per test strip.

Cleaning performance (CP) was measured three times and is shown in the Table as CP in %.

Table

	E1	E2	E3	E4	E5	E6	V1
Conc.	1 C./0.1 l	5 C./0.1 l	1 C./1 l	5 C./1 l	1 C./10 l	5 C./10 l	6 ml/1 l
CP	83	86	69	71	52	66	53

The cleaning performance of a liquor prepared with only one capsule in 10 liters of water (**E%**) is almost as high as that of a conventional liquor containing 6 ml of cleaner per liter of water (**V1**). A liquor prepared with one capsule per liter of water (**E3**) shows distinctly increased cleaning

performance in relation to **V1**. In the case of **E4**, **E1** and **E2**, cleaning performance can be controllably increased as required through the number of capsules.

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CLAIMS

1. An encapsulated active substance for a manual cleaning composition for hard surfaces comprising

A) a substantially water-free active substance containing

- 5 (i) at least one surfactant and
(ii) at least one liquid polymeric carrier

and

B) a water-soluble or water-dispersible capsule,
the active substance

- 10 (ii) containing the liquid polymeric carrier in a quantity, based on
the active substance, of less than 25% by weight
and/or

- (iii) containing at least one unbranched or branched, acyclic or
cyclic, saturated or unsaturated alcohol containing 1 to 10
15 carbon atoms and one or two primary, secondary or tertiary
hydroxy groups and a carbon chain optionally interrupted by
one or more oxygen atoms -O-

and/or

- (iv) being free from glycerol.

20

2. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains at least one anionic or nonionic surfactant as surfactant (i).

3. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains at least one anionic and at least one nonionic surfactant as surfactant (i).

4. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains

- a) at least one anionic surfactant corresponding to general formula (I):

30



and/or

b) at least one anionic surfactant corresponding to general formula II:

5



10

in which R^1 and R^3 independently of one another represent aliphatic, linear and/or branched C_{6-22} alkyl groups and/or aromatic, optionally C_{1-18} -alkyl-substituted hydrocarbon radicals, R^2 stands for hydrogen and/or one or more C_{1-4} alkyl groups, x is a number of 0.1 to 6 and M stands for metal cations or ammonium ions

as surfactant (i).

15

5. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains at least one fatty alcohol polyglycol ether and/or at least one alkyl polyglycoside as surfactant (i).

20

6. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains at least one alkyl ether sulfate and at least one fatty alcohol polyglycol ether as surfactant (i).

25

7. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains one or more polyethylene glycols as liquid polymeric carrier (ii).

30

8. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains at least one unbranched, acyclic, saturated primary C_{1-8} monoalcohol, one unbranched, acyclic saturated C_{2-6} alkylene glycol and/or one unbranched, acyclic saturated C_{2-6} alkylene glycol mono- C_{1-8} -alkyl ether as component

(iii).

9. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the active substance contains amphoteric surfactants or sequestering agents or additives or a mixture of
5 two or more thereof.

10. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the capsule contains at least one natural or synthetic polymer.

11. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the capsule contains gelatine.
10

12. An encapsulated active substance as claimed in any of the preceding claims, characterized in that the capsule has a volume of 0.1 to 30 ml.

13. The use of the encapsulated active substance claimed in any of the preceding claims as a manual cleaning composition for hard surfaces.
15

14. A process for the manual cleaning of a hard surface with a water-based cleaning liquor, characterized in that the cleaning liquor is prepared by dissolving or dispersing at least one encapsulated active substance as claimed in any of claims 1 to 12 in water.

15. A process as claimed in claim 14, characterized in that the cleaning liquor is prepared by dissolving or dispersing one to five encapsulated active substances in 0.1 to 10 liters of water.
20

16. A system containing two or more different encapsulated active substances of which at least one is an encapsulated active substance as claimed in any of claims 1 to 12.
25

17. A system as claimed in claim 16, characterized in that, besides one or more different encapsulated active substances according to the invention, it contains one or more encapsulated active substances each containing one or more additives.

Type a plus sign (+) inside this box → ☐

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Rev. 6/95

U.S. Department of Commerce
Patent and Trademark Office

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION

☒ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial Filing

Attorney Docket Number

H 3775 PCT/US

First Named Inventor

JONKE, Hermann

COMPLETE IF KNOWN

Application Number

Filing Date

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

ENCAPSULATED DETERGENT

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY)

11/18/1998

as United States Application Number or PCT International

Application Number

PCT/EP99/08806

and was amended on (MM/DD/YYYY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
198 54 267.4	Germany	11/25/1998	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority sheet attached hereto:

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.
		<input type="checkbox"/>

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DECLARATION

Page 2

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s), or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code §112.1 acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
	PCT/EP99/08806	11/16/1999	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto.

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

☐ Firm Name Customer Number or label

☒ List Attorney(s) and/or agent(s) name and registration number below:

Name	Registration Number	Name	Registration Number
Wayne C. Jaeschke	21,062	Glenn E. J. Murphy	33,539
Kimberly R. Hild	39,224	Stephen D. Harper	33,243

☐ Additional attorney(s) and/or agent(s) named on a supplemental sheet attached hereto.

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Name Glenn E. J. Murphy

Address Henkel Corporation - Patent Department

Address 2500 Renaissance Boulevard, Suite 200

City Gulph Mills State PA ZIP 19406

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned

Given Name	<u>Hermann</u>	Middle Initial		Family Name	<u>JONKE</u>	Suffix e.g. Jr.	
Inventor's Signature					Date	<u>May 14, 2001</u>	
Residence: City	<u>Duesseldorf</u>	State		Country	<u>Germany</u>	Citizenship	<u>Germany</u>
Post Office Address	<u>Sudetenstr. 26</u>						
Post Office Address							
City	<u>40231 Duesseldorf</u>	State		Zip		Country	<u>Germany</u>
Applicant Authority							

☒ Additional inventors are being named on supplemental sheet(s) attached hereto

DECLARATION					ADDITIONAL INVENTOR(S) Supplemental Sheet		
Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
Given Name	Brigitte <i>2 w</i>	Middle Initial		Family Name	GIESEN	Suffix e.g. Jr.	
Inventor's Signature	<i>Brigitte Giesen</i>				Date	<i>May 14, 2001</i>	
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Post Office Address							
City	40625 Duesseldorf	State		Zip		Country	Germany
				Applicant Authority			
Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
Given Name	Daniela <i>500</i>	Middle Initial		Family Name	POETHKOW	Suffix e.g. Jr.	
Inventor's Signature	<i>Daniela Poethkow</i>				Date	<i>May 14, 2001</i>	
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Post Office Address							
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				Applicant Authority			
Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
Given Name	Alexander <i>4-00</i>	Middle Initial		Family Name	DITZE	Suffix e.g. Jr.	
Inventor's Signature	<i>Alexander Ditze</i>				Date	<i>May 14, 2001</i>	
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Post Office Address							
City	40599 Duesseldorf	State		Zip		Country	Germany
				Applicant Authority			
Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
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Inventor's Signature					Date		
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Post Office Address							
City	40822 Mettmann	State		Zip		Country	Germany
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Patent and Trademark Office

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION



Declaration
Submitted
with Initial Filing

OR



Declaration
Submitted after
Initial Filing

Attorney Docket
Number

H 3775 PCT/US

First Named
Inventor

JONKE, Hermann

COMPLETE IF KNOWN

Application Number

Filing Date

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

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(Title of the invention)

the specification of which



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Kimberly R. Hild	39,224	Stephen D. Harper	33,243

☐ Additional attorney(s) and/or agent(s) named on a supplemental sheet attached hereto.

Please direct all correspondence to: ☐ Customer Number or label OR ☒ Fill in correspondence address below

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:

☐ A petition has been filed for this unsigned

Given Name	Hermann		Middle Initial		Family Name	JONKE		Suffix e.g. Jr.	
Inventor's Signature							Date		
Residence: City	Duesseldorf		State		Country	Germany		Citizenship	Germany
Post Office Address	Sudetenstr. 26								
Post Office Address									
City	40231 Duesseldorf		State		Zip		Country	Germany	Applicant Authority

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Inventor's Signature					Date		
Residence: City	Duesseldorf	State		Country	Germany	Citizenship	Germany
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Post Office Address							
City	40625 Duesseldorf	State		Zip		Country	Germany
						Applicant Authority	
Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
Given Name	Daniela	Middle Initial		Family Name	POETHKOW	Suffix e.g. Jr.	
Inventor's Signature					Date		
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Post Office Address							
City	47809 Krefeld	State		Zip		Country	Germany
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Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
Given Name	Alexander	Middle Initial		Family Name	DITZE	Suffix e.g. Jr.	
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Post Office Address							
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Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor							
Given Name	Dagmar <i>5-00</i>	Middle Initial		Family Name	ZAICA	Suffix e.g. Jr.	
Inventor's Signature	<i>Dagmar Zaika</i>				Date	<i>May 14, 2001</i>	
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Post Office Address							
City	40822 Mettmann	State		Zip		Country	Germany
						Applicant Authority	
<input type="checkbox"/> Additional inventors are being named on supplemental sheet(s) attached hereto							